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Abstract

Three trace electromechanical circuits and methods of using same are described. A circuit includes first and second electrically conductive elements with a nanotube ribbon (or other electromechanical elements) disposed therebetween. The nanotube ribbon is movable toward at least one of the first and second electrically conductive elements in response to electrical stimulus applied to at least one of the first and second electrically conductive elements and the nanotube ribbon. Such circuits may be formed into arrays of cells. The upper and lower electrically conductive traces may be aligned or unaligned vertically. An electrical stimulus may be applied to at least one of the first and second electrically conductive elements and the nanotube ribbon to move the nanotube ribbon toward at least one of the first and second electrically conductive elements. Electrical signals from at least one the first and second electrically conductive elements and the nanotube ribbon may be sensed to determine the electrical state of the cell. The states may be assigned in a variety of ways. For example, if the ribbon is moved toward the first electrically conductive element, the electrical state is a first state; if the ribbon is moved toward the second electrically conductive element, the electrical state is a second state; and if the ribbon is between the first and second electrically conductive elements, the electrical state is a third state. The first, second, and third states each corresponds to a different information encoding. Or, electrical stimulus may be applied to both the first and second electrically conductive elements so that the first and second electrically conductive elements both cause the movement of the nanotube ribbon. Or, the first and second electrically conductive elements are used in a fault tolerant manner.